

**Practical Manual**

## **Farm Machinery & Power**

**AAE 234 2(1+1)**

B.Sc. (Hons.) Agriculture III semester

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**2019**

**College of Agriculture  
Rani Lakshmi Bai Central Agricultural University  
JHANSI-284003**

## Syllabus

Study of different components of I.C. engine. To study air cleaning and cooling system of engine, Familiarization with clutch, transmission, differential and final drive of a tractor, Familiarization with lubrication and fuel supply system of engine, Familiarization with brake, steering, hydraulic control system of engine, Learning of tractor driving, Familiarization with operation of power tiller, Implements for hill agriculture, Familiarization with different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow . Familiarization with seed-cum-fertilizer drills their seed metering mechanism and calibration, planters and transplanter Familiarization with different types of sprayers and dusters Familiarization with different inter-cultivation equipment, Familiarization with harvesting and threshing machinery.

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## Experiment No. 1

**Objective: To study about the various components of an Internal Combustion (I.C.) Engine.**

Identify the different components of an I. C. engine and describe them:

1. **Cylinder:** -----  
-----  
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i. **Cylinder Block:** -----  
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ii. **Cylinder Head:** -----  
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iii. **Cylinder Liner or Sleeve:** -----  
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2. **Piston:** -----  
-----  
-----

i. **Piston Head:** -----  
-----  
-----

ii. **Skirt:** -----  
-----

iii. **Piston Ring:** -----  
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-----

**Functions:** -----  
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-----  
-----

**Types of piston rings:**-----

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-----  
-----  
-----

**iv. Piston Pin:** -----

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-----

**3. Connecting Rod: :** -----

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-----  
-----

**4. Crankshaft: :** -----

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-----

**5. Flywheel:** -----

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-----

**6. Crankcase:** -----

-----  
-----

**7. Camshaft:** -----

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-----  
-----

**8. Timing Gear: :** -----

-----  
-----

**9. Inlet Manifold:** -----

-----

**10. Exhaust Manifold:** -----

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## Experiment No. 2

**Objective:** To study about principle and working of four-stroke I.C. engine.

**Principle of operation of Internal Combustion Engine:**

i. -----  
-----  
-----

ii. -----  
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-----

**Working of Four Stroke Cycle Engine:** -----  
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**Describe the different strokes of an I.C. engine:**

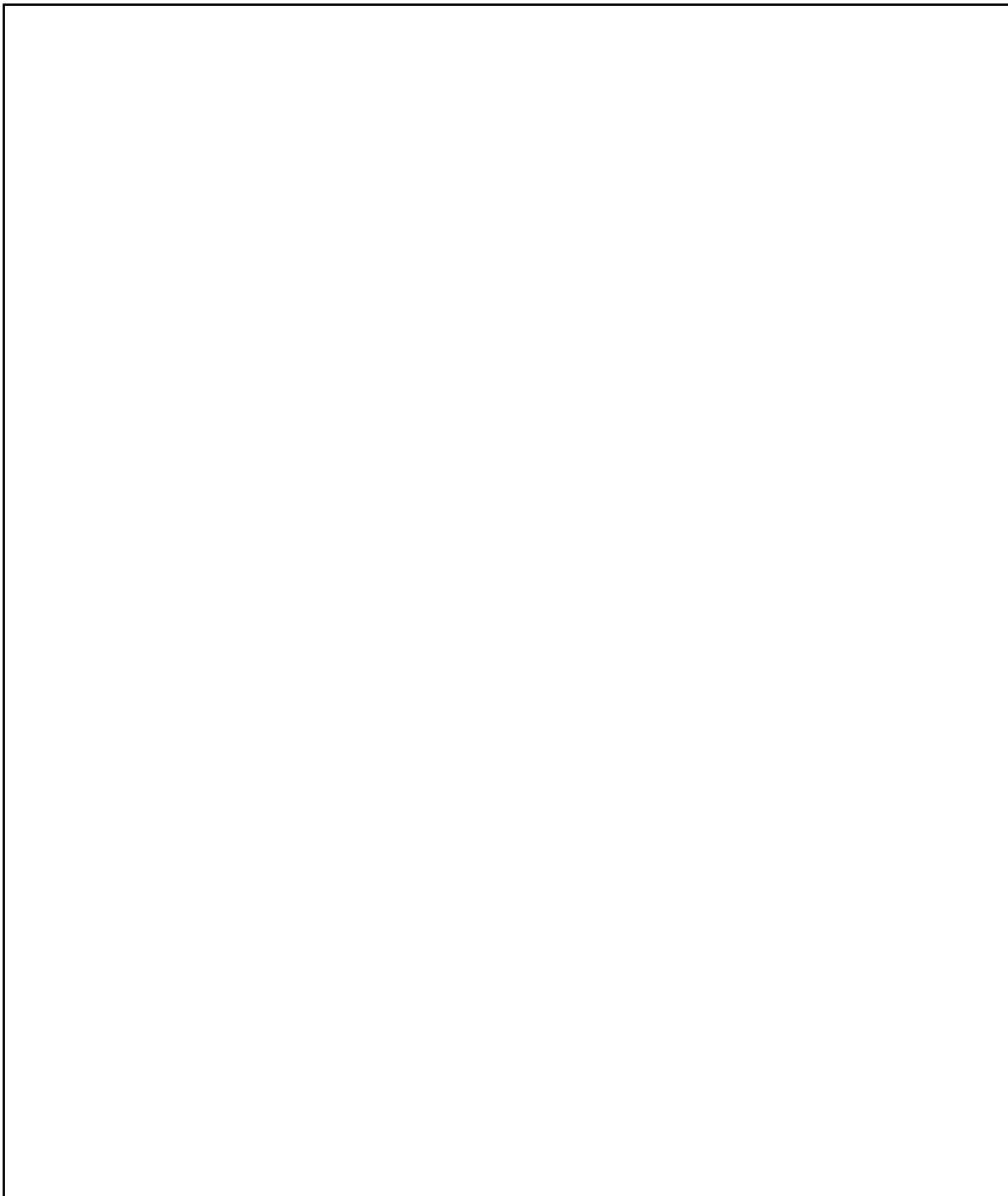
**1. Suction Stroke:** -----  
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**2. Compression Stroke:** -----  
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**3. Power Stroke:** -----  
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**4. Exhaust Stroke:** -----  
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Schematic representation of 4-S cycle engine





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## Experiment No. 4

**Objective: To study about the fuel supply system in an engine.**

**Fuel supply systems in S. I. engines:**

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**Fuel supply system of C.I. Engine**

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**Components of the fuel system in diesel engine are:**

1. 

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2. 

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3. 

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4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_

**Fuel Lift Pump (Feed Pump or Transfer Pump):**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Fuel Injection Pump:**

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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Experiment No. 5**

**Objective: To study about the cooling and air cleaning system of an engine.**

**Cooling System:** -----  
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-----

**Necessity of Cooling:** -----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----

**Methods of Cooling:**

**Air Cooling:** -----  
-----  
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-----

**Principle of Air Cooling:** -----  
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**Advantages of Air-Cooled Engine:** -----  
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*(The top section of the page contains 25 horizontal dashed lines for writing.)*

**Air cleaner:** -----  
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**1. Dry type air cleaner:** -----  
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**2. Oil bath type air cleaner:** -----  
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**Experiment No. 6**

**Objective: To study about the need and importance of lubrication system in an engine.**

**Need of Lubrication System:** -----  
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**Types of Lubricants:** -----  
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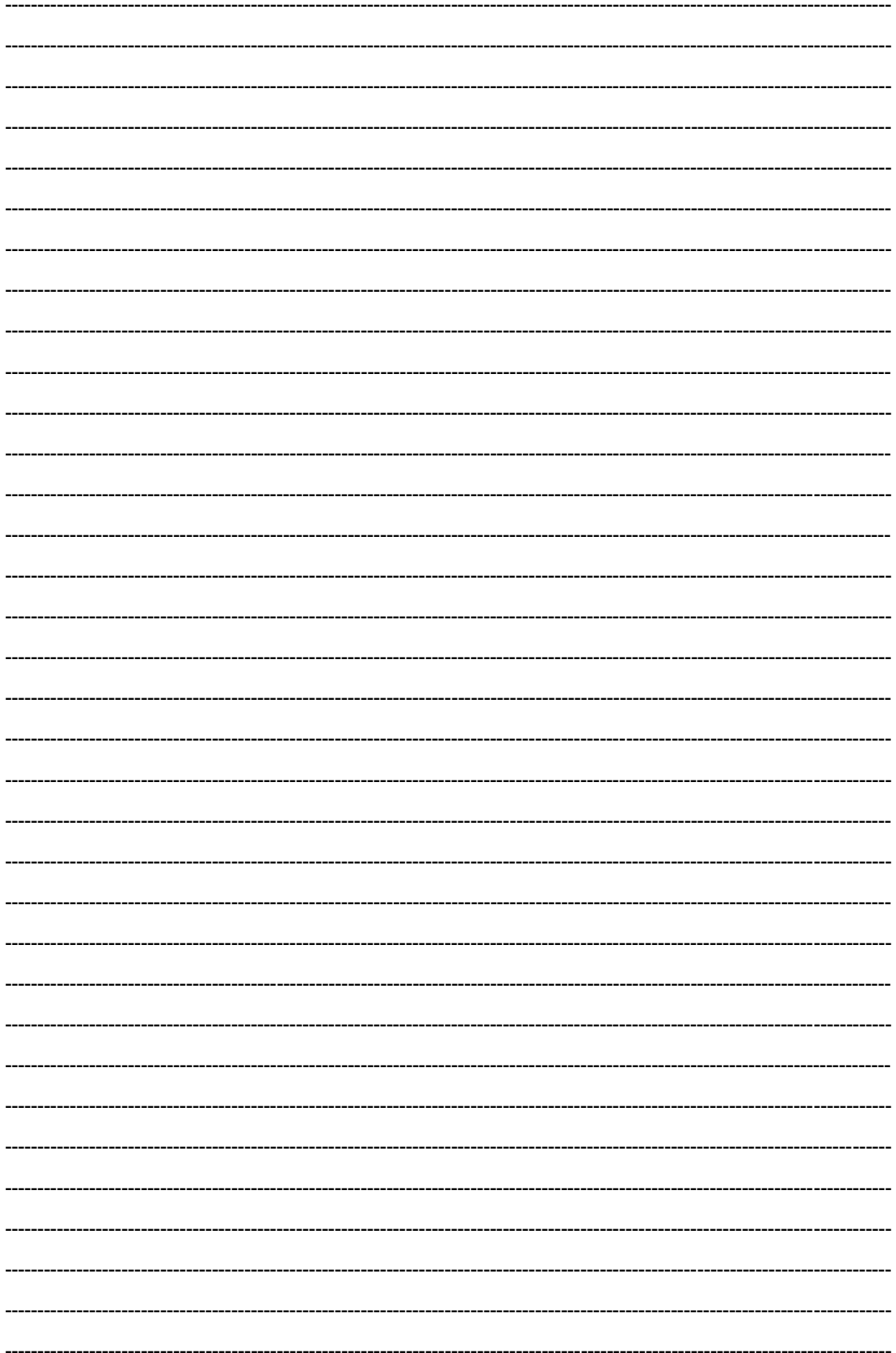
**Purpose of Lubrication:** -----  
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**Name the engine parts which requires lubrication:**

- |          |          |
|----------|----------|
| 1. ----- | 3. ----- |
| 2. ----- | 4. ----- |







Types of Clutch:

Gear:

Differential and final drive of a tractor: -----









## Experiment No. 9

**Objective:** Familiarization with hydraulic control system of a tractor.

**Hydraulic System:** -----

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-----  
-----

**Working principle:** -----

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-----  
-----

**Basic Components of Hydraulic System:**

(i) -----

(ii) -----

(iii) -----

(iv) -----

(v) -----

(vi) -----

(vii) -----

**Operation:** -----

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-----  
-----

**Hydraulic pump:** -----

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-----  
-----

**Hydraulic cylinder:** -----

-----  
-----  
-----

Hydraulic tank: -----

Control valve: -----

Oil filter: -----

**TYPES OF HYDRAULIC SYSTEM**

- (i) -----
- (ii) -----
- (iii) -----

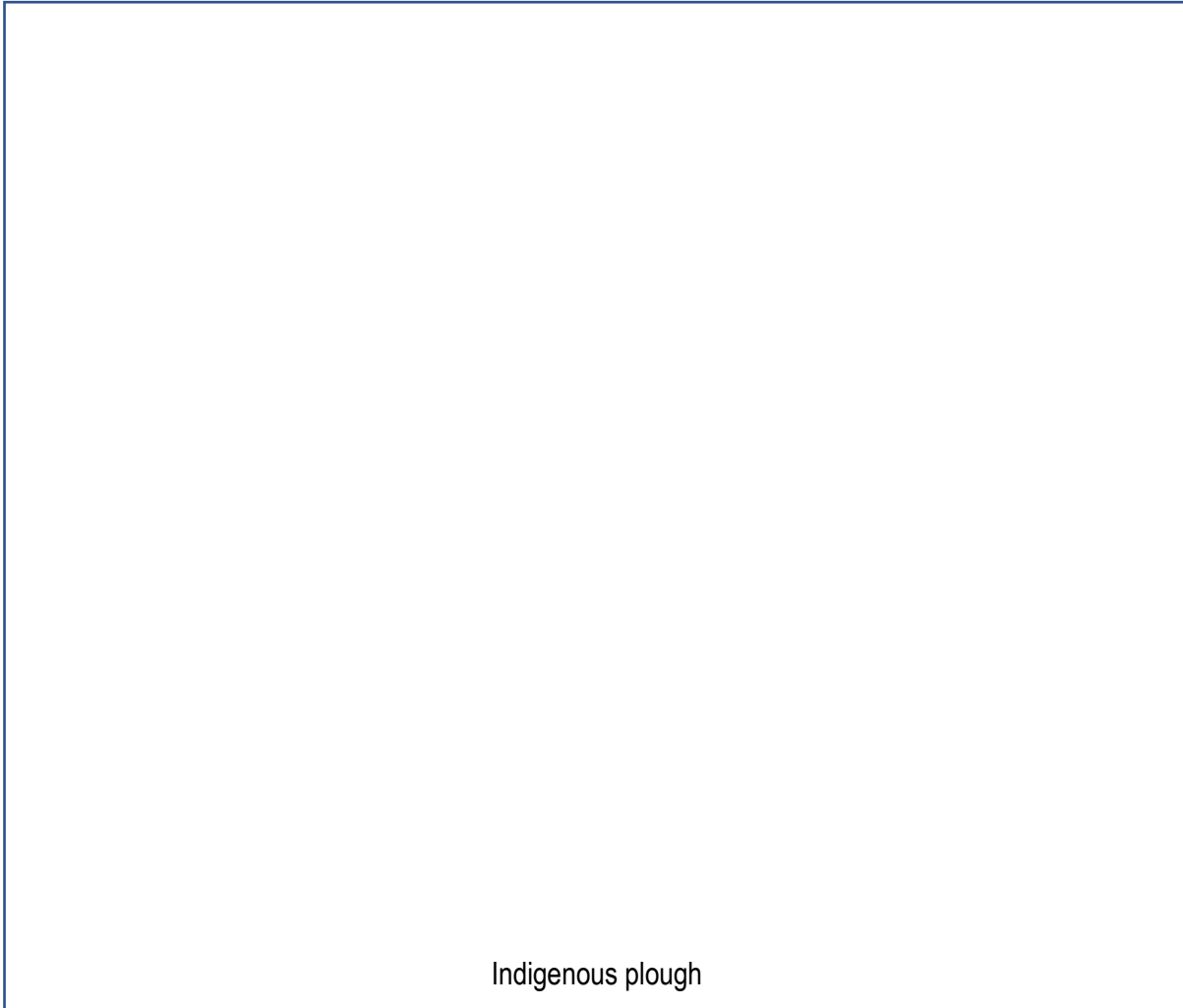
**Explain the various hydraulic systems:** -----



## Experiment No. 10

**Objective: Familiarization with the primary tillage implements: Indigenous plough, MB plough and Disc plough.**

Indigenous plough: -----  
-----  
-----  
-----



**Components:**

| S. No. | Particulars | Materials used for construction | Function |
|--------|-------------|---------------------------------|----------|
| 1.     | Share       |                                 |          |
| 2.     | Body        |                                 |          |
| 3.     | Shoe        |                                 |          |
| 4.     | Handle      |                                 |          |
| 5.     | Beam        |                                 |          |



M. B. plough

**Components:**

| S. No. | Particulars | Material used in construction | Function |
|--------|-------------|-------------------------------|----------|
| 1.     | Share       |                               |          |
| 2.     | Mould board |                               |          |
| 3.     | Land side   |                               |          |
| 4.     | Frog        |                               |          |
| 5.     | Tail piece  |                               |          |

**Observations to be recorded:**

| S. No. | Particulars            | M.B. Plough |
|--------|------------------------|-------------|
| 1.     | No. of Bottom          |             |
| 2.     | Length (mm)            |             |
| 3.     | Width (mm)             |             |
| 4.     | Height (mm)            |             |
| 5.     | Weight (Kg)            |             |
| 6.     | Type of Share          |             |
| 7.     | Field Capacity (ha/hr) |             |
| 8.     | Type of Hitching       |             |

|     |                                   |  |
|-----|-----------------------------------|--|
| 9.  | Rear furrow wheel                 |  |
| 10. | Depth of furrow (cm)              |  |
| 11. | Width of furrow (cm)              |  |
| 12. | Power required to operate (in hp) |  |
| 13. | Draft (kg)                        |  |
| 14. | Vertical Suction                  |  |
| 15. | Throat Clearance                  |  |

**Disc Plough:** -----  
-----  
-----  
-----  
-----



Disc plough

**Advantages of Disc Plough:**-----  
-----  
-----  
-----

**Limitations:** -----  
-----



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-  
**Terminology related to Disc Plough:**

1. Disc: -----  
-----  
-----

-  
2. Disc Angle: -----  
-----  
-----

3. Tilt Angle: -----  
-----  
-----

4. Concavity: -----  
-----  
-----

**A. Standard Disc Plough:** -----  
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**B. Vertical Disc Plough:** -----  
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**Plough Adjustments:** -----  
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**Components:**

| S. No. | Particulars | Materials used for construction | Function |
|--------|-------------|---------------------------------|----------|
| 1.     | Frame       |                                 |          |
| 2.     | Disc        |                                 |          |
| 3.     | Land wheel  |                                 |          |
| 4.     | Shaft       |                                 |          |
| 5.     | Scraper     |                                 |          |
| 6.     | Spool       |                                 |          |

**Observations to be recorded:**

| S. No. | Particulars            | Disc Plough |
|--------|------------------------|-------------|
| 1.     | No. of Bottom          |             |
| 2.     | Length (mm)            |             |
| 3.     | Width (mm)             |             |
| 4.     | Height (mm)            |             |
| 5.     | Disc                   |             |
|        | Number                 |             |
|        | Diameter (cm)          |             |
|        | Spacing                |             |
|        | Concavity              |             |
|        | Thickness (mm)         |             |
| 6.     | Weight (Kg)            |             |
| 7.     | Disc angle             |             |
| 8.     | Tilt angle             |             |
| 9.     | Field Efficiency (%)   |             |
| 10.    | Field Capacity (ha/hr) |             |
| 11.    | Type of Hitching       |             |
| 12.    | Rear furrow wheel      |             |
| 13.    | Depth of ploughing     |             |
| 14.    | Width of ploughing     |             |



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**Explain the components of disc harrow**

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1. Disc: -----  
-----  
-----

2. Gang: -----  
-----  
-----

3. Gang bolt or Arbor bolt: -----  
-----  
-----

4. Gang control lever: -----  
-----  
-----

5. Spool or spacer: -----  
-----  
-----

6. Bearing: -----  
-----  
-----

7. Transport wheel: -----  
-----  
-----

8. Scraper: -----  
-----  
-----

9. Weight box: -----  
-----  
-----

**Observations to be recorded:**

| S. No. | Particulars                                    | Disc Harrow |
|--------|--|-------------|
| 1.     | Type of harrow                                 |             |
| 2.     | Gangs  |             |
| 3.     | Gang angle (degree)                            |             |
| 4.     | Disc   |             |
|        | Number of discs in each gang                   |             |
|        | Diameter (cm)                                  |             |
|        | Spacing (cm)                                   |             |
|        | Concavity (cm)                                 |             |
|        | Thickness (cm)                                 |             |
|        | Type (notched/plane/cone)                      |             |
| 5.     | Maximum width of front gang and rear gang (cm) |             |
| 6.     | Operating width (cm)                           |             |
| 7.     | Weight (Kg)                                    |             |
| 8.     | Length of spool (cm)                           |             |
| 9.     | Length of scraper (cm)                         |             |
| 10.    | Field Efficiency (%)                           |             |
| 11.    | Field Capacity (ha/hr)                         |             |
| 12.    | Type of Hitching                               |             |
| 13.    | Depth of ploughing (cm)                        |             |
| 14.    | Power required to operate (in hp)              |             |
| 15.    | No. of Scrapers                                |             |
| 16.    | Overall dimension                              |             |
| 17.    | Draft per meter of width (kg)                  |             |

**Cultivator:**-----  
 -----  
 -----  
 -----  
 -----

**Types of cultivator:** -----  
 -----  
 -----  
 -----



-----  
-----  
-----  
**Explain the components of a cultivator:**

1. Frame: -----  
-----  
-----

2. Seeding attachment: -----  
-----  
-----

3. Shovel: -----  
-----  
-----

4. Tyne: -----  
-----  
-----

5. Handle: -----  
-----  
-----

6. Beam: -----  
-----  
-----

**Observations to be recorded:**

| S. No. | Particulars             | Cultivator |
|--------|-------------------------|------------|
| 1.     | Type of cultivator      |            |
| 2.     | Type of shovel          |            |
| 3.     | No. of tynes            |            |
| 4.     | Spacing of tynes (cm)   |            |
| 5.     | Type of bolt            |            |
| 6.     | Shank                   |            |
| 7.     | Shank angle             |            |
| 8.     | Type of hitching        |            |
| 9.     | Field Efficiency (%)    |            |
| 10.    | Depth of ploughing (cm) |            |

|     |                                   |  |
|-----|-----------------------------------|--|
| 11. | Width of furrow (cm)              |  |
| 12. | Weight (Kg)                       |  |
| 13. | Power required to operate (in hp) |  |
| 14. | Overall dimension (mm)            |  |
| 15. | Draft (kg)                        |  |

**Experiment No. 12**

**Objective: To study about the seed-cum-fertilizer drill and its calibration.**

**Seed Drill:** -----  
 -----  
 -----  
 -----  
 -----

**Function of Seed Drill:** Seed drill performs the following functions:

- (i) -----
- (ii) -----
- (iii) -----
- (iv) -----
- (v) -----

**Seed-cum-fertilizer Drill:** -----  
 -----  
 -----  
 -----  
 -----  
 -----  
 -----  
 -----

**Explain the components of seed drill**

1. Frame: -----  
 -----  
 -----
2. Seed box: -----  
 -----  
 -----



3. Seed metering mechanism: -----  
-----  
-----
4. Furrow openers: -----  
-----  
-----
5. Covering device: -----  
-----  
-----
6. Transport wheels: -----  
-----  
-----

**Observations to be recorded:**

| S. No. | Particulars   | Seed drill |
|--------|---|------------|
| 1.     | Type of seed drill                                  |            |
| 2.     | Type of seed to be sown                             |            |
| 3.     | Seed box  |            |
|        | Shape   |            |
|        | Length (cm)   |            |
|        | Top width (cm)                                      |            |
|        | Bottom width (cm)                                   |            |
| 4.     | Type of agitator                                    |            |
| 5.     | Type of seed metering mechanism                     |            |
| 6.     | Diameter of seed metering device (cm)               |            |
| 7.     | Width of circumference of seed metering device (cm) |            |
| 8.     | Type of hitching                                    |            |
| 9.     | Number of furrow opener                             |            |
| 10.    | Type of furrow openers                              |            |
| 11.    | Type of covering device                             |            |
| 12.    | Field Efficiency (%)                                |            |
| 13.    | Depth of sowing (cm)                                |            |
| 14.    | Diameter of ground wheel                            |            |
| 15.    | Weight (Kg)   |            |
| 16.    | Power required to operate (in hp)                   |            |
| 17.    | Type of power transmission                          |            |







3. Transmission gears: -----  
-----  
-----

4. Brakes: -----  
-----  
-----

5. Rotary Unit: -----  
-----  
-----

**Identification of parts of power tiller:**

| S . No. | Name of Part | S . No. | Name of Part |
|---------|--------------|---------|--------------|
| 1.      |              | 2.      |              |
| 3.      |              | 4.      |              |
| 5.      |              | 6.      |              |
| 7.      |              | 8.      |              |
| 9.      |              | 10.     |              |
| 11.     |              | 12.     |              |
| 13.     |              | 14.     |              |
| 15.     |              | 16.     |              |
| 17.     |              | 18.     |              |
| 19.     |              | 20.     |              |

## Experiment No. 14

**Objective:** To study about the tractor drawn planter.

**Planter:** -----  
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-----  
-----  
-----  
-----

**Functions of a planter:**

- (i) -----
- (ii) -----
- (iii) -----
- (iv) -----

**Components of a planter:**

| S. No. | Particulars          | Function |
|--------|----------------------|----------|
| 1.     | Hopper               |          |
| 2.     | Feed metering device |          |
| 3.     | Knock out mechanism  |          |
| 4.     | Cut-out mechanism    |          |
| 5.     | Furrow opener        |          |
| 6.     | Furrow closer        |          |
| 7.     | Drive mechanism      |          |
| 8.     | Seed tube            |          |
| 9.     | Seed boot            |          |

**Observations to be recorded:**

| <b>S. No.</b> | <b>Particulars</b>                                      | <b>Tractor drawn planter</b> |
|---------------|---|------------------------------|
| 1.            | Type of planter   |                              |
| 2.            | Type of seed to be sown                                 |                              |
| 3.            | Seed box  |                              |
|               | Shape   |                              |
|               | Length (cm)   |                              |
|               | Top width (cm)  |                              |
|               | Bottom width (cm)                                       |                              |
| 4.            | Type of agitator  |                              |
| 5.            | Type of seed metering mechanism                         |                              |
| 6.            | Diameter of seed metering device (cm)                   |                              |
| 7.            | Width of circumference of seed metering device (cm)     |                              |
| 8.            | Type of hitching  |                              |
| 9.            | Number of furrow opener                                 |                              |
| 10.           | Type of furrow openers                                  |                              |
| 11.           | Type of covering device                                 |                              |
| 12.           | Field Efficiency (%)                                    |                              |
| 13.           | Row maker   |                              |
| 14.           | Depth of sowing (cm)                                    |                              |
| 15.           | Diameter of ground wheel                                |                              |
| 16.           | Weight (Kg)   |                              |
| 17.           | Power required to operate (in hp)                       |                              |
| 18.           | Type of power transmission                              |                              |
| 19.           | Type of chain   |                              |
| 20.           | Distance covered in one revolution of ground wheel (cm) |                              |
| 21.           | Width of sowing (cm)                                    |                              |
| 22.           | Area covered/hr   |                              |

## Experiment No. 15

**Objective: To study about the power operated sprayer.**

**Sprayers:** -----  
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-----  
-----

The main functions of sprayer are: -----  
-----  
-----  
-----  
-----

**Explain Basic Components of Sprayer:**

| S. No. | Particulars        | Function |
|--------|--------------------|----------|
| 1.     | Nozzle body        |          |
|        |                    |          |
| 2.     | Swirl plate        |          |
|        |                    |          |
| 3.     | Filter             |          |
|        |                    |          |
| 4.     | Over-flow pipe     |          |
|        |                    |          |
| 5.     | Relief valve       |          |
|        |                    |          |
| 6.     | Pressure regulator |          |
|        |                    |          |
| 7.     | Cut-off valve      |          |
|        |                    |          |
| 8.     | Spray boom         |          |
|        |                    |          |
| 9.     | Nozzle boss        |          |
|        |                    |          |



|     |             |  |
|-----|-------------|--|
| 10. | Nozzle disc |  |
|     |             |  |
| 11. | Nozzle cap  |  |
|     |             |  |
| 12. | Nozzle tip  |  |
|     |             |  |
| 13. | Spray lance |  |
|     |             |  |
| 14. | Spray gun   |  |
|     |             |  |

**Power Sprayer:** -----  
-----  
-----  
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-----

A power sprayer essentially consists of:

- |             |            |
|-------------|------------|
| (i) -----   | (iv) ----- |
| (ii) -----  | (v) -----  |
| (iii) ----- | (vi) ----- |



Tractor mounter power sprayer

**Observations to be recorded:**

| <b>S. No.</b> | <b>Particulars</b>                              | <b>Power operated sprayer</b> |
|---------------|---|-------------------------------|
| 1.            | Prime mover                                     |                               |
| 2.            | Pressure gauges                                 |                               |
| 3.            | Air chamber                                     |                               |
| 4.            | Strainer  |                               |
| 5.            | Pressure regulator                              |                               |
| 6.            | Type of nozzle                                  |                               |
| 7.            | Tank capacity (litres)                          |                               |
| 8.            | Volumetric Efficiency (%)                       |                               |
| 9.            | Cut-off valve                                   |                               |
| 10.           | Relief valve                                    |                               |
| 11.           | Swirl plate                                     |                               |
| 12.           | Operating pressure (kPa or kg/cm <sup>2</sup> ) |                               |
| 13.           | Overflow pipe                                   |                               |
| 14.           | Type of pump                                    |                               |

**Objective: Familiarization with different inter-cultivation equipment.**

**Need of Intercultural Operation:** -----

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**Classification of weeding tools on the Basis of Source of Power:**

1. Manual or Traditional hand tools.
2. Animal drawn weeders.
3. Power or Tractor operated weeders.

**1. Manual or Traditional hand tools:**

**Khurpi:** -----

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**Kodali:** -----

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**Spades or Chopping hoes:** -----

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**Long handle tools:** -----

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**Wheel hoe type weeders:** -----

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**a) Star type weeder:** -----

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b) Peg type weeder: -----

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Dryland weeder

2. Animal drawn weeder: -----

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Sweep: -----

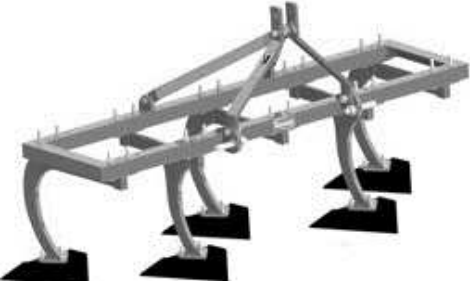
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Junior hoe: -----

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Duck foot cultivator: -----

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**3. Power or Tractor operated weeders**

**(i) Engine operated weeder:** -----

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**(ii) Engine operated rotary tiller:** -----

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**(iii) Tractor operated spring tye cultivator:** -----

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**(iv) Rotary hoe:** -----

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**Experiment No. 17**

**Objective: To study about the power operated reaper.**

**Harvesting:** -----  
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**Explain components of reaper**

| <b>S. No.</b> | <b>Particulars</b>      | <b>Function</b> |
|---------------|-------------------------|-----------------|
| 1.            | Frame                   |                 |
|               |                         |                 |
| 2.            | Power transmitting unit |                 |
|               |                         |                 |
| 3.            | Cutter bar              |                 |
|               |                         |                 |
| (i)           | Guard point             |                 |
|               |                         |                 |
| (ii)          | Knife guard             |                 |
|               |                         |                 |
| (iii)         | Reciprocating knife     |                 |
|               |                         |                 |
| (iv)          | Knife bar               |                 |
|               |                         |                 |

|      |              |  |
|------|--------------|--|
| (v)  | Main bar     |  |
|      |              |  |
| (vi) | Ledger plate |  |
|      |              |  |
| 4.   | Star wheel   |  |
|      |              |  |

**Observations to be recorded:**

| S. No. | Particulars                        | Power operated reaper |
|--------|------------------------------------|-----------------------|
| 1.     | Type of reaper                     |                       |
| 2.     | Prime mover                        |                       |
| 3.     | Cutter bar length (m)              |                       |
| 4.     | Width of cutter bar (m)            |                       |
| 5.     | Type of cutter bar                 |                       |
| 6.     | Operating speed (km/hr)            |                       |
| 7.     | Height of cutting (cm)             |                       |
| 8.     | Theoretical field capacity (ha/hr) |                       |
| 9.     | Actual field capacity (ha/hr)      |                       |
| 10.    | Weight (kg)                        |                       |
| 11.    | Suitability                        |                       |
| 12.    | Total grain losses (%)             |                       |
| 13.    | Harvesting losses (%)              |                       |
| 14.    | Fuel consumption (litres/hr)       |                       |
| 15.    | Field Efficiency (%)               |                       |



**Objective:** To study about the power operated thresher.

**Power thresher:** -----

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**Types of Power threshers:**

**Hammer mill type:** -----

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**Rasp-bar-cylinder type:** -----

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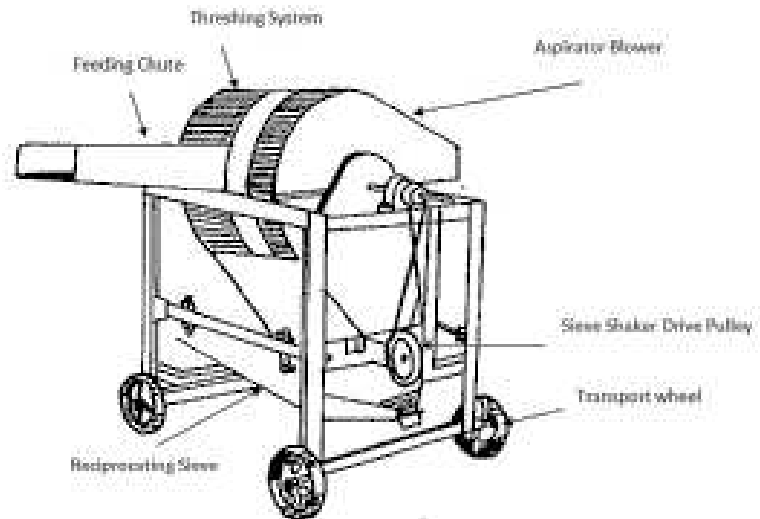
**Spike-tooth cylinder type:** -----

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**Syndicator type:** -----

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Drummy type:



**Components of Power thresher**

| S. No. | Particular                            | Function |
|--------|---------------------------------------|----------|
| 1.     | Concave                               |          |
| 2.     | Cylinder or drum                      |          |
|        | (i) Peg-tooth or spike tooth cylinder |          |
|        | (ii) Rasp-bar cylinder                |          |

|    |                               |  |
|----|-------------------------------|--|
|    |                               |  |
|    | (iii) Angle bar cylinder      |  |
|    |                               |  |
|    | (iv) Loop type cylinder       |  |
|    |                               |  |
|    | (v) Hammer-mill type cylinder |  |
|    |                               |  |
| 3. | Cleaning unit                 |  |
|    | (i) Aspirator                 |  |
|    |                               |  |
|    | (ii) Blower                   |  |
|    |                               |  |
|    | (iii) Winnowing               |  |
|    |                               |  |

**Observations to be recorded:**

| S. No. | Particulars                     | Power operated thresher |
|--------|---------------------------------|-------------------------|
| 1.     | Type of thresher                |                         |
| 2.     | Prime mover                     |                         |
| 3.     | Concave clearance (mm)          |                         |
| 4.     | Diameter of flywheel (cm)       |                         |
| 5.     | Diameter of flywheel shaft (mm) |                         |
| 6.     | Diameter of cylinder (cm)       |                         |
| 7.     | Length of cylinder (cm)         |                         |
| 8.     | Type of cylinder                |                         |
| 9.     | Cleaning unit                   |                         |
| 10.    | Cylinder speed (rpm)            |                         |
| 11.    | Number of beaters               |                         |
| 12.    | Capacity (kg/hr)                |                         |
| 13.    | Cleaning Efficiency (%)         |                         |
| 14.    | Threshing Efficiency (%)        |                         |
| 15.    | Length of straw (cm)            |                         |
| 16.    | Suitability                     |                         |

|     |  |  |
|-----|--|--|
| 17. | Distance between thresher to straw dropped |  |
|-----|--|--|

Appendix

**Calibration Steps:**

1. Determine the nominal width (W) of drill.

$$W = M \times S$$

where M- number of furrow openers

S- spacing between the openers (m)

W- Width (m)

2. Find the length of a strip (L) having nominal width (W) necessary to cover 1/25th of a hectare.

$$L = \frac{10000}{W} \times \frac{1}{25} = \frac{400}{W} \text{ metres}$$

3. Determine the number of revolutions (N) the ground wheel has to make to cover the length of the strip (L).

$$\pi \times D \times N = \frac{400}{W}$$

where D -diameter of ground wheel in metre

$$N = \frac{400}{\pi \times D \times W} \text{ rev /min}$$

4. Jack up the drill so that the ground wheels turn freely. Make a mark on the drive wheel and a corresponding mark at a convenient place on the body of the drill to help in counting the revolutions of the drive wheel.
5. Put selected seed and fertilizer in the respective hoppers. Place a sack or a container under each boot for seeds and fertilizers.
6. Set the rate control adjustment for the seed and the fertilizer for maximum drilling. Mark this position on the control for reference.
7. Engage the clutch or on-off adjustment for the hoppers and rotate the drive wheel at the speed (N)
8. Weigh the quantity of seed and fertilizer, dropped from each opener and record on the data sheet.
9. Calculate the seed and fertilizer, dropped in kg/hectare and record on the data sheet.
10. Repeat the process by suitable adjusting the rate control till desired rate of seed and fertilizer drop is obtained.